

Experiment No.: 01

Name of the Experiment: Get Familiar with Simulink and FFT analysis of signals

Objectives:

- To know About Basic Simulink Operation and Get Familiar with Simulink
- To Do an FFT Analysis of Given Circuit Output Signal

Required Software:

- MATLAB

**Introduction:** Simulink is an important tool for Engineers and Scientists. Using the concept of simulation results can be predicted for thousand of different model or system. Actually, there are many real-life cases doing thousands or even million of experiment is not possible and also not Economical but using computer simulation that can be done easily. Same can be said for circuit simulation. So, Simulink is a MATLAB based graphical programming environment for modeling, simulating and analyzing multidomain dynamical System. In this Electrical & Electronic Circuit Simulation Lab many simple and complex circuit can be solved easily and their output can be analyzed and seen using Simulink.

Circuit Diagram & Output:

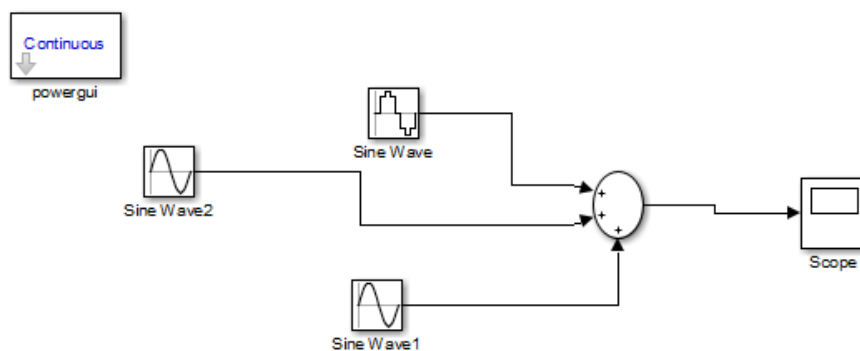


Figure 1.1: Block Diagram of FFT analysis Circuit in Simulink

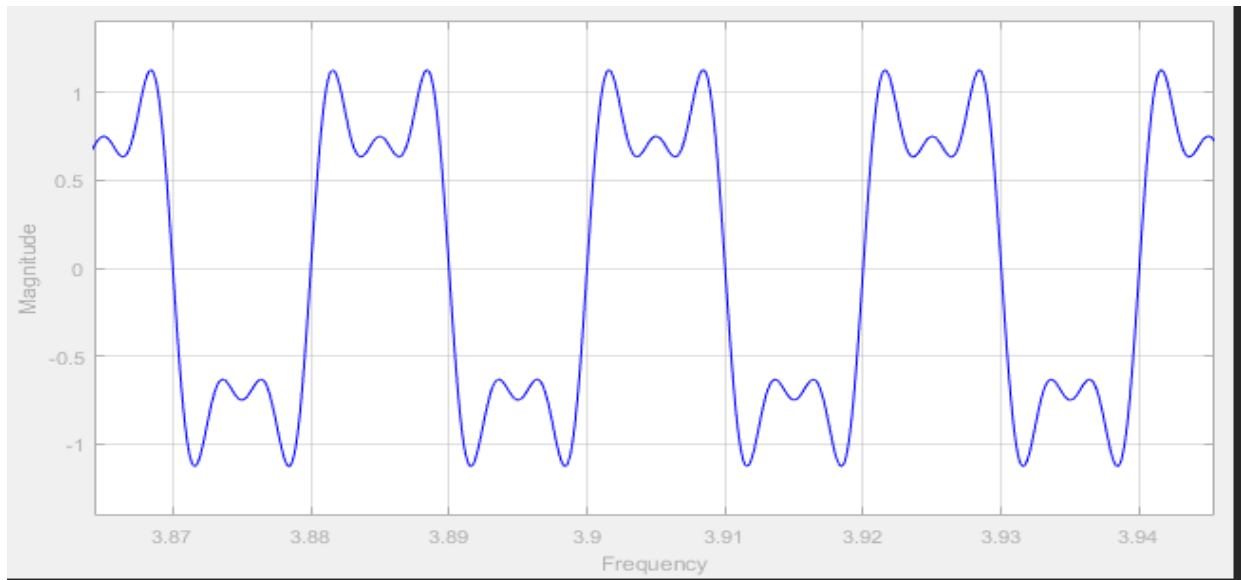
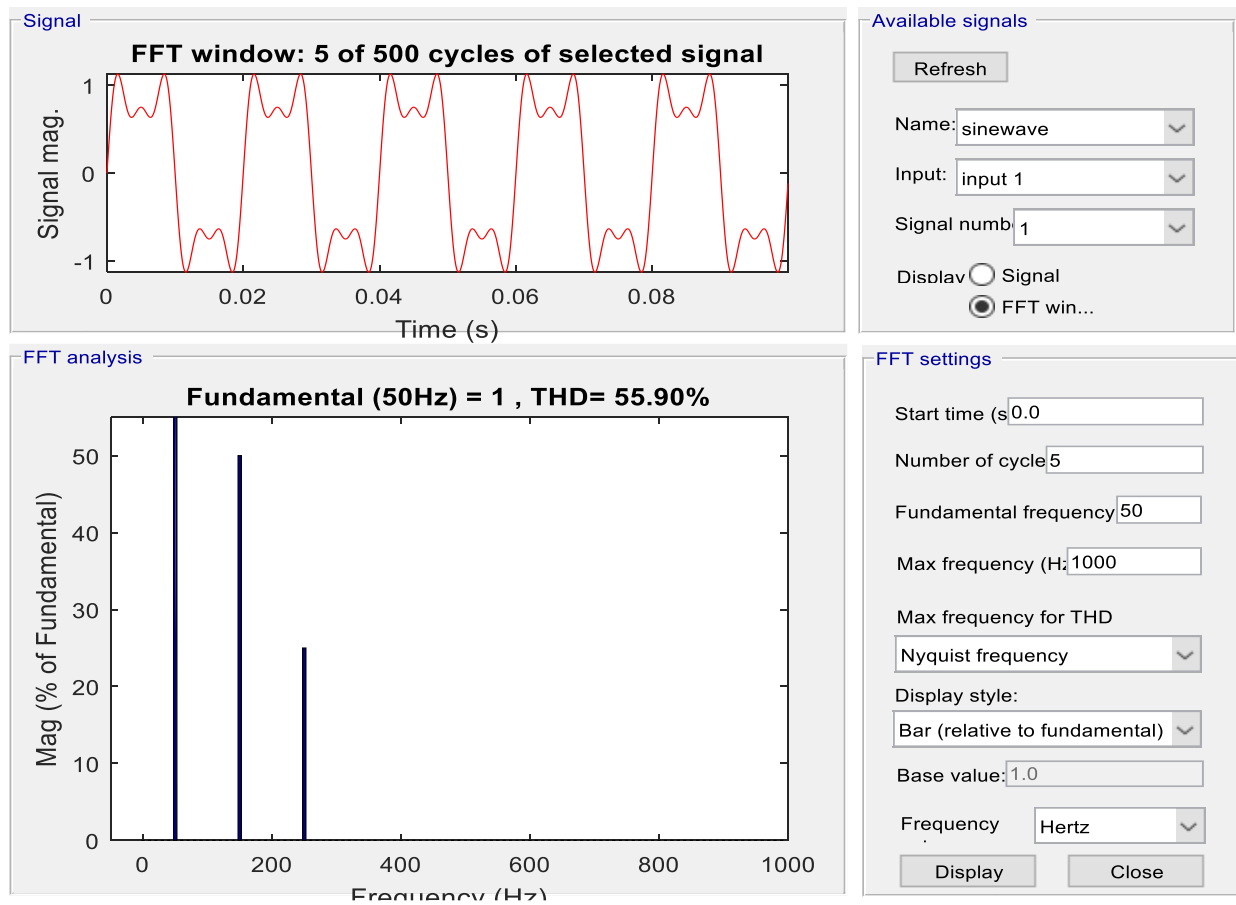


Figure 1.2.: Output of Scope in FFT analysis Circuit in Simulink

FFT Analysis:



**Importance of Mux:** The Mux block combines input signals and in the same time all the input signals can be seen all together. Multiple Mux blocks can be used to create a Mux signal in stages.

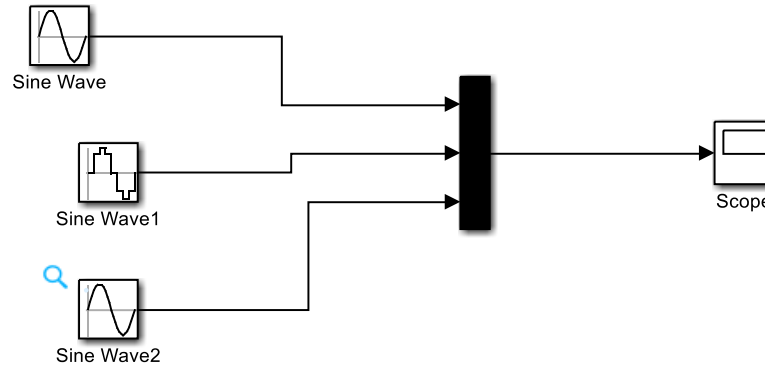


Figure 1.3: Block Diagram of Circuit using Mux in Simulink

Output:

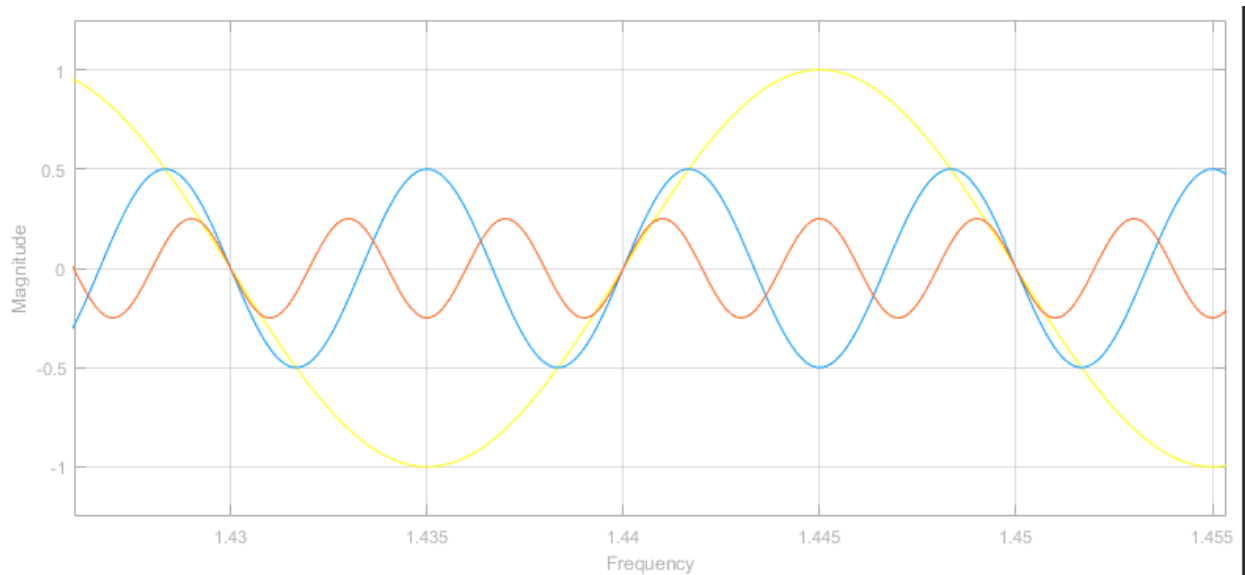


Figure 1.4: Output of Block Diagram Circuit Using Mux in Simulink

Math-Operations:

Use of Sum:

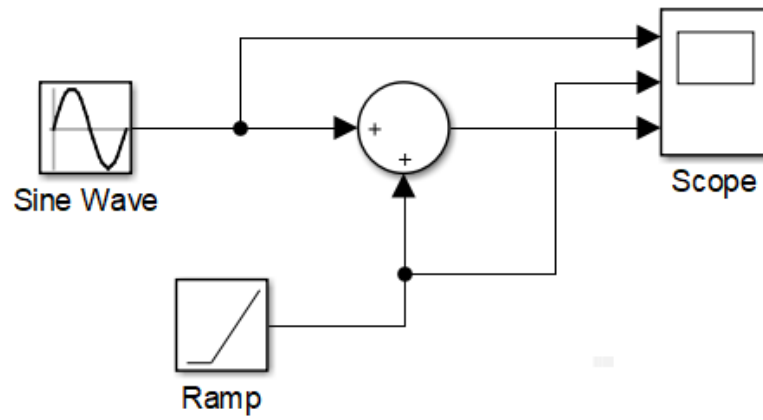


Figure1.5.: Block Diagram using Sum block in Simulink

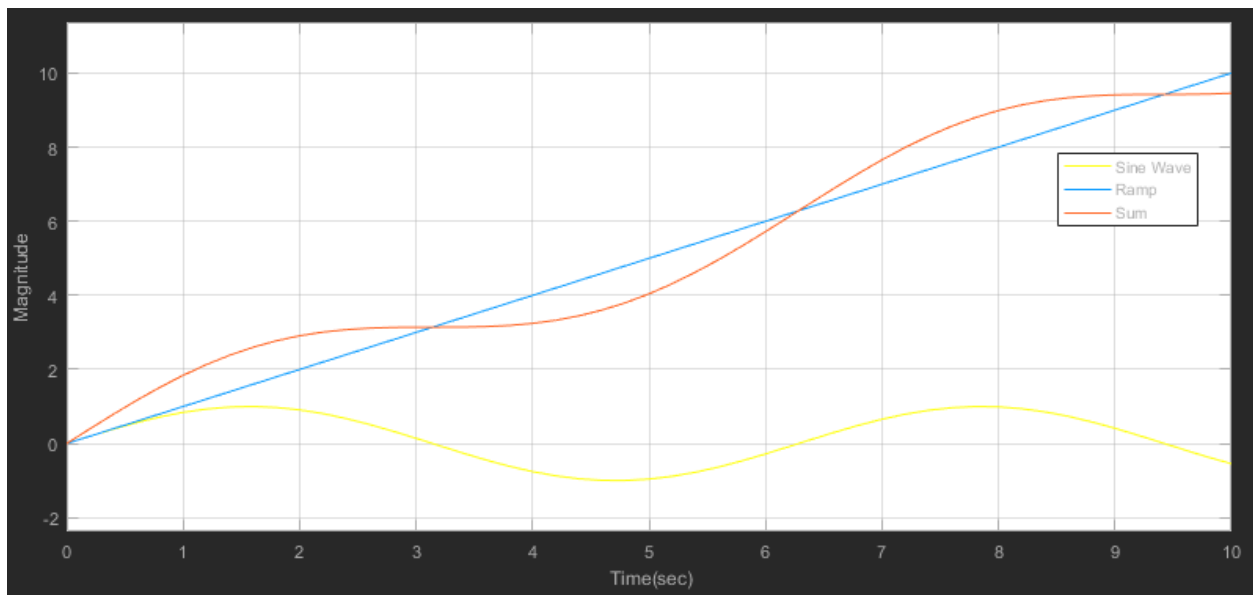


Figure 1.6.: Output of Block Diagram Using Sum Block

Similarly, Add and Subtract block works the same way as sum block.

Use of Gain, Sqrt, min/max function:

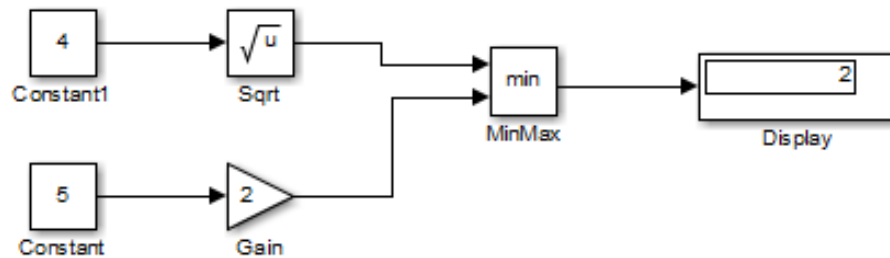


Figure 1.6.: Block Diagram using Sqrt, Min/Max, Gain Function of Math Operation

Use of Math Function, Reciprocal Sqrt, Product function:

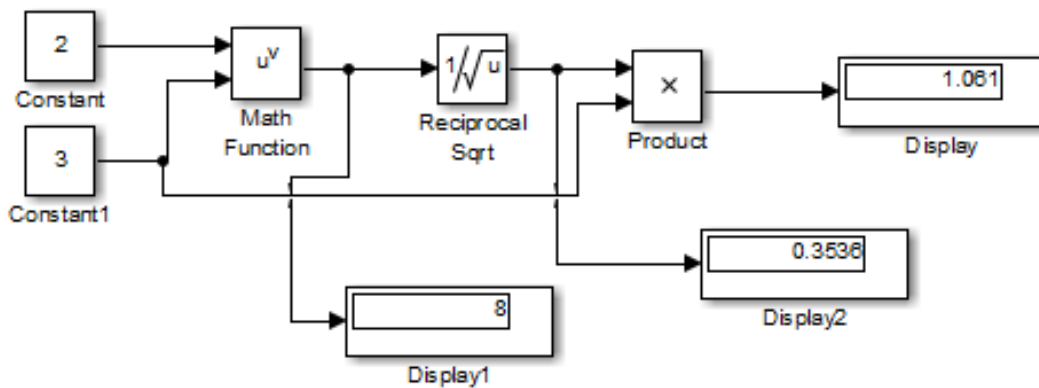


Figure 1.7.: Block Diagram using Math Function, Reciprocal Sqrt, Product function of Math Operation

Use of Subtract, Sign, Signed sqrt, Rounding Function:

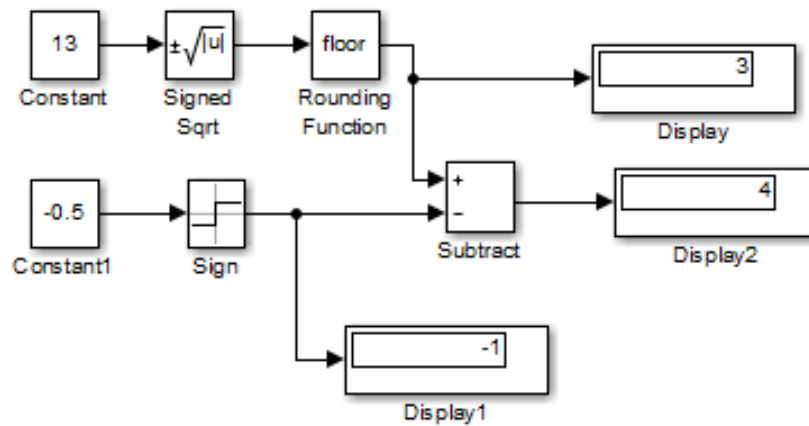


Figure 1.8.: Block Diagram using Subtract, Sign, Signed sqrt, Rounding Function of Math Operation

Use of Real-Imaginary to Complex, Complex to magnitude and angle and Complex to Real and Imaginary Function:

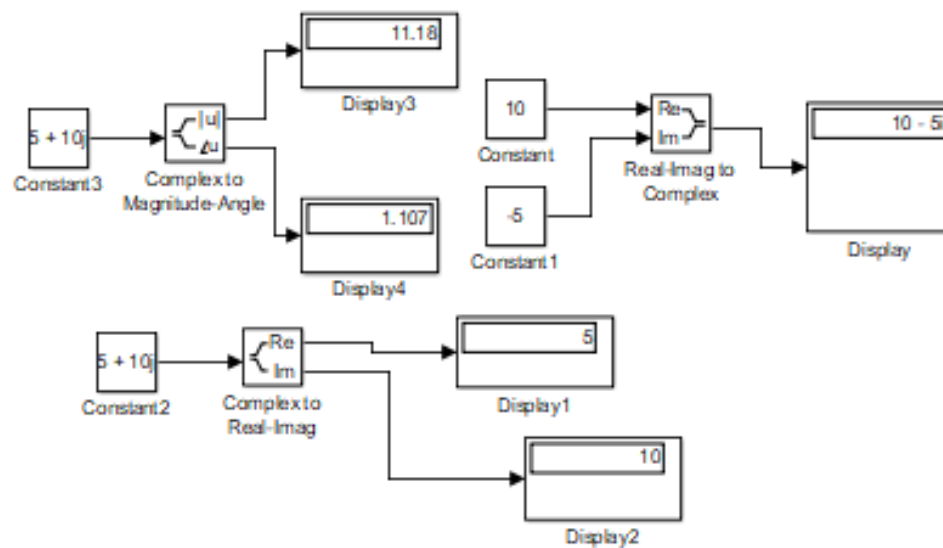


Figure 1.9.: Block Diagram using Real-Imaginary to Complex, Complex to magnitude and angle and Complex to Real and Imaginary Function of Math Operation

